# Iteracies of feeling

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# ITERACIES OF FEELING

## Abstract

Computational readings of culture allow us to pose new questions or create new cultural forms supporting new forms of critical thinking and reading. Yet the machine may not be able to identify some of the qualities, such as emotion, that might be central to the question raised. Using the Next Rembrandt project as a case study, this paper suggests an approach to consider the medium as the site of meaning making in digital culture and how this affects critical practice using Raymond Williams, David Berry and Jacques Derrida. In the first part, I consider the idea of reading with machines and how this might be considered within the medium. The second part uses iteracy to find meaning in the models and how this might reveal new critical paths through readings of the image. The final part presents a reading of the digital object itself and how these can be used to create a space for meaning to come into being. Through this, the article raises questions about critical techniques for understanding the material object in distant reading methodologies as ongoing research.

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Computational readings of culture allow us to pose new questions or create new cultural forms supporting new forms of critical thinking and reading. Yet the machine may not be able to identify some of the qualities, such as emotion, that might be central to the question raised. The advantages of distant reading, such as scale, may be tempered by a realisation of what may be missing.

Using the Next Rembrandt project as a case study, the aim of this paper is to suggest an approach to consider the medium as the site of meaning making in digital culture and how this affects critical practice. In the first part, I consider the idea of reading with machines and how this might be considered within the medium. The second part uses David Berry's iteracy to find meaning in the models and how this might reveal new critical paths. The third part presents a reading of the digital object itself and how these can be used to create a space for meaning to come into being.

Raymond Williams's structures of feeling suggest a way of beginning to think about this new understanding. I build on this conception that "a cultural hypothesis, actually derived from attempts to understand such elements and their connections in a generation or period, and needing always to be returned, interactively, to such evidence"(133) by situating the elements and connections within a digital reading. Computational reading derives features from the data based on human thought and interpretation of the hypothesis, either in the construction of algorithms or labelling of data. Once identified, the features may then be analysed or combined to create new structures and elements. Qualitative feelings such as emotions become uncertain elements that the quantitative seeks to understand through models. I will suggest that a critical reading of the digital object reveals ways in which the human might be understood and to suggest a critical practice.

This suggests two critical responses that I will explore in this paper. The consideration of structures of feeling requires not only human reading but also technical reading itself using models to understand the digital. Reflecting on Hayles's sense that print is shallow but code is deep, I suggest that this develops cyborg reading, where the "reader necessarily is constructed as a cyborg, spliced into an integrated circuit with one or more intelligent machines" (85), a technique to interpret the medium's discourse. I want to develop this through the way that reading digital culture means reading with machines to understand the data.

I want to develop this reading as an experimental process as well as considering the materiality of computational culture. Berry's iteracy, "the ability to read, write and understand processes" (190), is a key to understanding the artefact and to interact with its relocation of epistemology. This uses both cultural hypotheses and evidence to test how the data is being created, so placing a human meaning into the process. Building on Berry and Fagerjord's call that "culture […] is materialised and fixed in forms specific to material digital culture",(142) I want to think about how the presentation of the final form reveals and hides the metamedium nature of the digital, capable of transforming existing media and creating new media and technologies.

# Next Rembrandt

In this section, I want to consider the Next Rembrandt[1] and to think about how it is read with machines. The project was an experiment to create a new picture from a reading of Rembrandt's portraits, shown in Figure 1. The Next Rembrandt is an algorithmically generated image by a partnership of J. Walter

**Figure 1: Image of the Next Rembrandt. Photo: J. Walter Thompson Amsterdam.**

Thompson Amsterdam, ING, Microsoft, TU Delft and the Mauritshuis. Using high resolution 3-dimensional scans and digital versions of 346 of Rembrandt's portraits, machine learning algorithms identified the key points to be created from 150 Gigabytes of generated graphics. Using a mix of cloud and physical machines, the algorithms were tested and run in parallel. The rendering of the portrait took 500 hours on machines and a 3-dimensional printed picture is created from 148 million pixels. The computational aspects both hide themselves behind and are bound into the impression of paint.

This impression is an imitation made up from a digital reading of the drops of paint and the intentional layering to be recreated in 3-dimensions for the physical portrait. The created form echoes an earlier tradition to present itself as a singular object. A closer reading suggests that Finn's assertion that "code can be magical" (5), where the code is an agent in changing the world and the mind, is at play here. The layered paint sections hint at algorithms used to create them as does the gaze in both editions of the painting. The attempts at authenticity in both digital forms provoke a desire to read it more closely, to understand the entwined cultures, but the machine resists traditional cultural readings to fully tease apart the layers. Authenticity becomes inauthentic, unless it is read with a machine or a machine in mind.

As a digital object, a machine is required to read and render the cultural data through new models of space, location, and artistic models to make it visible to the human. Culture needs to be read through computational remediation. Yet the work appears to capture human aspects, such as emotion. Emotional reactions may have alternative meanings in the technical world. They may be seen as signs of both commercial and personal engagement or a data point in a model to suggest new content or to try to refine models of how to understand humans. Even these emotional points can be limited to a recognised and constrained set of emotions. We need to consider the contexts they exist in. Emotional markers may be read through sentiment analysis or from a reaction on a page by a machine looking for engagement or a commercial opportunity. Or is it learning how to recreate our reality through a numeric system?

## Reading with *machines*

We need to read with *machines* to begin accessing this culture and understanding its new forms.

The visual layer invites a human reading of the image and to infer the emotional states represented in the eyes and the wistful mouth. Within the given boundaries, the algorithms create an image using an intensely close reading of colour palettes and shades but can only imitate emotion. A reading of the object as a visualisation provokes questions about how the representation is considered, either as a close reading of the portraits so enhancing a trait that it reads or whether the algorithm has created it?

Having considered using machines to generate and process the data, I want to think about how we might begin to think with the machine and considering how they might generate knowledge. At the very least,

we must admit that we need to read with the machine. Born digital culture, like the Next Rembrandt, cannot be read by a human; it requires computational remediation. Such art alters our critical relationship with machines and raising a crucial role for questioning the medium itself as site of cognitive practice through remediation.

Using a machine to write data suggests that it is required to read and remediate it, so using it as part of the interpretation through the models encoded into the process. It may be mediated through visualisation or sonification processes, providing another area that needs to be understood. Instead of reading data, we read presentation models that affect hypothetical models as a strategy of not reading (Clement; Moretti, "Conjectures in World Literature"). This practice accepts that the quantity of information cannot be read at a close level, by humans but that broad patterns can be viewed through machines. In cultural terms, this builds on Moretti's concept that "distance is not an obstacle, but a *specific form of knowledge*: fewer elements, hence a sharper sense of their overall interconnection" (Moretti, *Graphs, Maps, Trees 1*). These abstractions, allowing the reading of patterns over specificities, are digital structures used to support interpretation or remediation. Machine interpretation may also be fuzzy and not show outliers or emerging patterns if they are too slow and long, suggesting that the subtleties of emotion may be aggregated through counts into clusters of readings at the machine level.

Although brought together as one image, the picture is a series of algorithmic observations. Each of these is a specific form of knowledge gained through the distant reading and pieced together through other forms of knowledge. The machine, through its learning algorithms, uses a hypothesis to test its understanding and creates an image. Its understanding of a structure is taken from the evidence, to which the evidence is returned once the process has tested it. I would suggest that this understanding is based in computational materiality.

The project is a close reading of portraits conducted by machines to create a machine-readable data set. The algorithms identify relevant parts of information. The resulting image requires computational remediation to convert the numeric world into a human readable one. In a very real fashion, we can only read the image with a machine. This echoes Adorno and Horkheimer's culture industry that broadcasts and replicates itself, where we rely on technology to create and remediate culture.

## Reading *with* machines

We begin to read *with* machines and to understand how both sides form and contribute to digital culture.

By this, I mean that we need to consider not only the interface and how that creates a reality but how we can use any given options or even access to the algorithms to consider the logics at play. Reflecting on the roots of iteracy as iteration, I want to think about how it can be used to repeat a process, perhaps with alterations, to allow the algorithm to be the point of interaction. Through making changes, user meaning can be given to the machine to continue hypothesis testing. When Next Rembrandt was being created, algorithms were repeatedly run in parallel. The repetition of these processes provides a space for the human thought to enter the process and realise the potential of Ramsay's algorithmic criticism (33) to reconceive both the form and criticism's logics in a playful form. Tweaking the parameters and repeating the process not only reveals the process through which the picture is made but also

allows humans into the iterative loop and realise the hypothetical nature of the work through experimentation. This site of interaction moves human cognition into the machine so as to embed the concept of thinking with the machine and its models.

The materiality of computation becomes more apparent through these acts. Researchers defined that the resulting person was Caucasian, male, wearing black clothes with a white collar and between thirty and forty. This suggests a machine logic that might recognise the image but requires guidance through wider cultural nuance that might be either difficult to model or statistically insignificant. This is translated into a model or set of constraints. The limitations of the machine's cultural understanding become more visible as does the imposition of human values into the reconstruction algorithms. Taking an active stance in considering how the computational both reads and writes the data reveals not only different meanings but suggests new critical practice.

Using machines raises questions about culture. Are new cultural forms appearing: ones that can be appreciated by both machines and humans? What forms of culture may arise from this? Who owns the created form? Is a new culture industry being created through the use of social media or infrastructure companies to create cultural forms?

I want to take a brief pause to consider the critical theoretical response to this position. At one remove, the process of creating the model of the image reduces the human to a set of constructs, such as average width between the eyes, which is then broadcast to the viewer. The digital can reproduce the image in a variety of forms from the same underlying data and the results of the imperfect structures are encoded in this view. Benjamin's assertion that "reproduction detaches the reproduced object from the domain of tradition" (215) can be operationalised to interrogate the structure in its new tradition.

The newly created digital reading raises questions as to which tradition is being developed. The artist becomes the subject of the work rather than the creator, though he is elided from the public gaze. As well as reading and showing the new structures of feeling, the object itself is not part of Rembrandt's tradition. Aside from the ownership questions, the newly created picture exists within an alternate context. Material questions about whether it can be considered as a work of new media art or data visualisation and what its relation to Rembrandt's oeuvre might be? Is it a creation or an analytical work? Digital reading of the portraits detaches this from the paintings and creates a new tradition through algorithms and processing power.

Infrastructural questions can be raised. One project partner, ING, fund cultural institutions, such as the Rijksmuseum, enabling cultural institutions to remain open. However, it might also be read as patronage. A culture industry arising from the financial ability to support human endeavour and the physical infrastructure. JWT Amsterdam also paid for the physical version of the painting to be created. This provokes further questions about the relationship between digital and physical artistic culture. The digital has the potential for writing, assuming the protected mode is off. An act of execution and change, writing is a permissioned act within computation. The machine owners may grant or deny the permission for non-owners to write any data without a visible infrastructure. As such, the culture shown is one where the non-corporate entity is deemed lower and granted read only permissions.

Patronage can be rethought through the computational. The scale of the data produced by the project as well as the amount of processing power needed to run the facial recognition and rendering processes on such a large digital object suggests that new

platforms are required. The infrastructure is provided by Microsoft in this instance. Both of these require financial and computational power so renewing patronage as a computational form. This embeds such providers into the warp and weft of digital culture. Without a return to reading with machines and considering their logics, we return to a transmit only culture. Technical specialisations create the conditions for a read only culture, so projecting their dominance into a cultural sphere. The rendered figure, through its created class and social standing, perhaps points to the role of the creative partners in creating the image.

The face is a construction of models and aggregations rather than being read and interpreted from a sitter. Critical questions remain about whether this project was a safe space to develop and use facial recognition and reconstruction algorithms. This project creates an ethical safe space to reflect on these algorithms within a known set of biases, ones defined in the underlying data set and the parameters given for the reconstruction. I want to raise these as critical issues to be able to interrogate the created image and the assumptions that give it focus.

The born digital image is both remediated into a human readable image and rendered as an artefact that I want to think of as reborn analogue. This latter form, the printed image, continues to challenge the concepts of tradition. Through being made into a physical object, it is placed into a museum setting that the funders support as well as what might be considered an old media cultural setting. The image is also available digitally and can be copied and reproduced. This latter tradition that is represented is one driven by the technological medium as something that can be easily shared at minimal effort. What the physical print elides is that it was printed from the digital file. Generated from the digital file, 'paint' is calculated through machine learning and printed in minor layers. The computational re-presents the paint medium as an abstraction that requires a deep reading to understand the artifice of a natural process. Paint drops become composed rather than accidental. As well as remediating the data into new forms, new tools and conceptual processes are required to understand the materiality of the object and how these fits in with existing traditions.

A consideration of the image involves its methods of creation. From here, we need to extend Hayles's notion of thinking through the network to consider the physical machines, such as printers, and materials involved. The printed image was not only made on a 3-dimensional printer but through layers of printing substrate, though both are controlled by the file made from the image. As well as encouraging us to read in different ways, we need to think about the techne itself and how this supports an epistemological reading.

Iteracy's root as literacy provokes questions of how one might read or listen to the results as abstractions and patterns. The act of interacting with the process embeds a human element in part of it, suggesting that the object being read comes from thinking through a network. Next Rembrandt may be read as an image but to understand it, one needs to consider new practices of reading and meaning making. In many aspects, this is a technically demanding reading. We might feel the sadness and warmth in the sitter's eyes or the slightly worn look derived from the way the light plays on the features and through the layers of paint. I contend that we are inside an interpretational loop, reading the evidence supplied to us from a hypothetical model encoded into the process. The machine uses aggregations of the models and the data to create a new set of data points derived through a model. The underlying algorithms create a numerical reading, themselves bound within what the

limitations of the algorithms and the hardware. Its surface is a visualisation, where mappings mediate the numerical data into a new point, which humans perceive as colour at a location. From a human perspective, we note the stylistic similarities, the attention to detail in the style and the emotion in the face. There is a disjunction here between the two readings that reveals the need for conceiving about how this can be critically approached. Read together, these data points begin to suggest the underlying logics, such as the position of light, as we move from a macro- to a microanalysis. With the assumption that we are unaware of the human provided limitations, the reading can interrogate how the machine reads the data to project a model of its understanding.

I want to turn to models as an integral part of these computational structures. McCarty echoes Weizenbaum in considering computational systems as dependent on the models given to them to understand a conception of the world. The use of Artificial Intelligence to create data sets and models raises questions of who is the designer and whose world is being created? The model's structure of an element rests on how the designer or implementer translates and transcodes the element into their work as well as the model's purpose. The model itself requires critical consideration of what is being modelled and what is being presented through the computational.

The use of the machine suggests that the computational materiality needs to be considered for what is being modelled and presented but how and the values that lie within the processes. Weizenbaum's consideration that the "symbolic recreation of [the designer's] world" (18) may be read in two ways. Firstly, the model and its associated processes reflect their purpose and process. Secondly, the medium affects the object through its own limitations and understanding but it shows a need for a critical practice to determine where the model might come from and how it is represented. As the data is being rendered, the model's values are being applied through the processes. The reconstructive stage shows the machine's iteration as it mapped the facial features to proportions until it achieved the final image. Through testing the image, the algorithms are testing themselves. Using this, one might read the intention behind the models that are shown and to understand the two readings available – the numerical and the rendered – and to probe its limitations.

A key point is Williams's issue with the specifics of what constitutes an element in discourse is further problematised through translation and encoding required for the machine to understand them as hypothetical constructs. A new discourse is created from the results, which require reading when it has bene returned to the evidence from whence it came. The underlying computer model both makes and is made from the translation. This alters the location of epistemology from the reading and interpretation to within the computational. A necessary consequence is a potential change of the location of the element's negotiation.

Whilst it may happen as part of wider cultural discourse, it is happening within the algorithms and their models of the world. As discussed, human intervention can help to mould the uncertain elements into an appreciable form through a combination generated from iterate readings.

## The digital object as pharmakon

Having considered the image and its consequences for realising the digital, I want to focus on the digital object itself. Having

discussed potential ways of making meaning, I want to illuminate the material that reshapes both it- and ourselves as the site of cognitive practice.

I see the pharmakon acting as discourse. Derived from Plato's view that writing "will make them remember things by relying on marks made by others, from outside themselves, not on their inner resources" (69), Derrida suggests that it "acts as both remedy and poison" (Derrida, *Dissemination 73*) and injects itself into discourse. At one level, text provides a discourse that can be read and shared, yet it also removes the ability to query the underlying discourse and remakes it in its own symbols. This imitation of practices suggests that there is a computational cognitive economy where only those who can create the tools to understand the digital object may interpret it. I suggest that by exposing the pharmakon, one can bring different tools to understand it. This suggests an alteration how we think the digital affects writing. Where Plato's writing loses both access to memory and the underlying discourse, the object is central to both as the locus between humans and machine cognitive practices. It both creates and transforms the cultural forms, acting as memory and discourse to express them.

The Next Rembrandt image is a medicine in its form. Without reflection of its materiality, hidden by the (in)authentic surface, it is a poison. Where the textual medium removes access to an oral discourse through remediation, the digital can be remediated into different media though the original language is computational. It can be accessed using tools and with permissions. Understanding that the digital can be presented in different ways, such as a born digital or a printed picture, creates the space for a critical gap to appear. Even using machines and programming languages, one has to acknowledge the translations and transcoding to converse across the layers. Taking Manovich's conception of the metamedium (101-102), critical practice becomes a tool of and about the medium. This practice, as shown above, does not necessarily need to use computational tools to be reflexive but can also be theoretical by bringing the object into a different being. Having suggested that the digital object is a pharmakon, I want to extend the reading through Derrida's différance and the use of play that it reveals.

As human and machine discourses mix, they reconstruct their own context into new discourse. The ontotheological message of a machine reading data becomes one with the potential for multiple meanings. As the model is read and processed as "a sort of writing" (Derrida, *Of Grammatology* 56), its form is recontextualised, moving from an image through numerical models to become its own grammatology. Realising that the object is made up of these changes recognises the différance, the gap created between the signifier and the signified when the computational elides itself. Although based on a learned aggregate set of elements, like the colouring and the geometries involved, a human reading may infer emotion into Next Rembrandt's eyes or face and realises a human part of the language. Where machine process may be limited in their qualitative meaning making, human readers may recognise the possibilities of the elements that exist as a series of interpretative gaps that expose the potential for new critical readings of the image.

Alternate considerations might be brought to the eye as a form of play. Derrida's consideration of play as a de-centring of meaning within bounds allows critical logics to be reconfigured. The new readings allow for interpretation to take place through experimentation, continuing the suggested move from a digital culture that projects its meaning. Iteracy and play work together with the pharmakon to create new contexts

and movements between remedy and poison. Different structures of feeling might be viewed as evidence to be interpreted. Our readings work to remake meaning within the boundaries through combining human and machine meanings. Doing this, we begin to recontextualise the medium as a site of cognitive practice where readings combine and recombine. I want to use reading with machines to think about critical practice beyond the interface and at the level of the medium.

Reading with machines supports methodological changes that are hinted at by Williams. The element's existence and its interpretative possibilities as part of an emerging discourse is problematised through this process. The remediation of the images in different media suggests that the presented evidence is a poisoned reading that is guided by the models of presentation. Translating a feature into a series of technical languages to create a new model and element alters the discourse and its specificities. It is only by looking for the imperfections in the surfaces that we are able to begin a reading that critiques these discourses. By taking part of the presented data, hypotheses can be formulated and tested. Meaning can be interrogated by altering parameters and questions to test the new way of thinking and interpretations, while recognising that the structures of feeling may be made of other structures. The evidence that we are examining for clues is made of other evidence and hypotheses that is generated from the machine.

# Conclusion

Using Williams's definition of structures of feeling as cultural hypotheses, this paper argues that they might be seen models of thought that are translated into computational models. The evidence is used to generate new cultural forms that are returned to the evidence that it came from. By understanding these processes as a mix of human and machine discourse, we can think about how to both interpret and interact with them. Iteracy encourages not only a different form of reading but also critical engagement with the underlying discourse, so considering the medium as the site of cognitive practice where discourses mix and create interpretative gaps. The claiming of the computational as a metamedium provokes the need for new practices of making meaning that consider the medium. These theoretical considerations are the subject of ongoing research into the digital object as a core concern in distant reading methodologies.

Rather than seeing the digital mediation of cultural forms as a machine-driven process, I contend that considering them within the medium opens up new forms of critical interpretation and techniques that use the revealed discourse. From this we understand that computational structures of *feeling* become imperfect *structures* of feeling.

## Notes

[1] Next Rembrandt, https://www.nextrembrandt.com/.

## Works cited

Adorno, Theodor and Horkheimer, Max. *Dialectic of Enlightenment*. London. Verso. 1997.

Berry, David M., *Critical Theory and the Digital*. London. Bloomsbury. 2014.

Berry, David M. and Fagerjord, Anders. *Digital Humanities,* Cambridge. Polity, 2016.

Clement, Tanya E., Steger, Sara, Unsworth, John, Uszkalo, Kirsten *"How Not to Read A Million Books,"* 2008, http://people.virginia.edu/~jmu2m/hownot2read.html.

Derrida, Jacques, Johnson, B (trans.) *Dissemination.* London, Bloomsbury, 2016.

Derrida, Jacques, Spivak, Gayatri Chakravorty (trans.) *Of Grammatology (40th Anniversary Edition*). Baltimore. John Hopkins University Press, 2016.

Finn, Andrew. *What Algorithms Wants: Imagination in the Age of Computing.* Cambridge, Massachusetts. MIT Press, 2017

Hayles, N. Katherine. "Print Is Flat, Code Is Deep: The Importance of Media-Specific Analysis". *Poetics Today*. 25 (2004): 67–90. https://doi.org/10.1215/03335372-25-1-67.

Manovich, Lev. *Software Takes Command.* London. Bloomsbury. 2013.

Moretti, Franco. *Graphs, Maps, Trees: Abstract Models for Literary History.* London. Verso. 2007.

Moretti, Franco. "Conjectures in World Literature," Moretti, F. *Distant Reading.* London. Verso, 2013.

Plato, Waterfield, Robin. (trans). *Phaedrus*, Oxford. Oxford University Press. 2002.

Ramsay, Stephen. *Reading Machines: Towards an Algorithmic Criticism.* Chicago and Springfield. University of Illinois Press, Urbana. 2011.

Weizenbaum, Joseph. *Computer Power and Human Reason: From Judgment to Calculation.* San Francisco. WH Freeman & Company. 1976.

Williams, Raymond. *Marxism and Literature.* Oxford. Oxford University Press. 1977.